

4 W X-BAND POWER GaAs FET
N-CHANNEL GaAs MES FET

DESCRIPTION

The NEZ1011-4E is power GaAs FET which provides high gain, high efficiency and high output power in X-band.

The internal input and output matching enables guaranteed performance to be achieved with only a 50 Ω external circuit.

To reduce thermal resistance, the device has a PHS (Plated Heat Sink) structure.

The device incorporates WSi (tungsten silicide) gate for high reliability and SiO₂ glassivation for surface stability.

FEATURES

- Class A operation
- High output power: 36.5 dBm (min)
- High gain: 7.5 dB (min)
- Internally matched
- High reliability

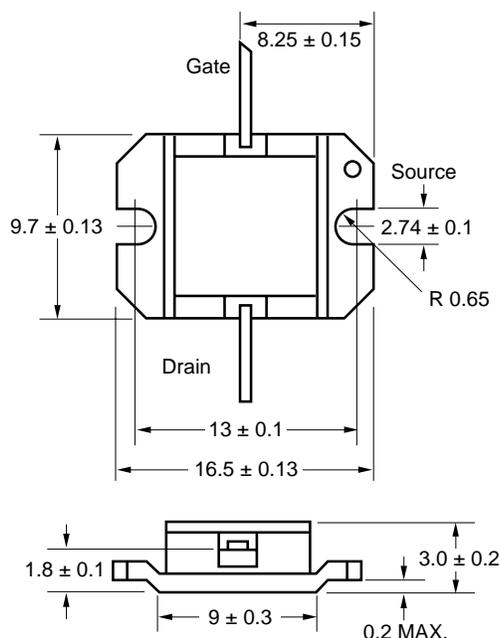
ABSOLUTE MAXIMUM RATINGS (T_A = 25 °C)

| | | | |
|-------------------------|--------------------|-------------------------|----|
| Drain to Source Voltage | V _{DS} | 15 | V |
| Gate to Source Voltage | V _{GS} | 7.0 | V |
| Drain Current | I _{DS} | 4.5 | A |
| Gate Forward Current | I _{GF} | 40 | mA |
| Gate Reverse Current | I _{GR} | -40 | mA |
| Total Power Dissipation | P _T (*) | 15 | W |
| Channel Temperature | T _{ch} | 175 | °C |
| Storage Temperature | T _{stg} | -65 to +175 | °C |
| | | *T _c = 25 °C | |

CAUTION

Please handle this device at a static-free workstation, because this is an electrostatic sensitive device.

PACKAGE DIMENSIONS (UNIT: mm)



RECOMMENDED OPERATING CONDITIONS

| CHARACTERISTIC | SYMBOL | MIN. | TYP. | MAX. | UNIT |
|-------------------------|-------------------|------|------|------|--------------------|
| Drain to Source Voltage | V _{DS} | 9 | 9 | 9 | V |
| Channel Temperature | T _{ch} | – | – | 130 | °C |
| Input Power | G _{comp} | – | – | 3 | dB _{comp} |

ELECTRICAL CHARACTERISTICS (T_A = 25 °C)

| CHARACTERISTIC | SYMBOL | MIN. | TYP. | MAX. | UNIT | TEST CONDITIONS |
|---------------------------------|------------------|------|------|------|------|--|
| Saturated Drain Current | I _{DSS} | 1.0 | 3.0 | 5.0 | A | V _{DS} = 1.5 V, V _{GS} = 0 V |
| Pinch-off Voltage | V _p | –3.0 | –1.3 | –0.5 | V | V _{DS} = 2.5 V, I _{DS} = 20 mA |
| Gate To Drain Breakdown Voltage | BV _{GD} | 15 | 18 | – | V | I _{GD} = 20 mA |
| Thermal Resistance | R _{th} | – | 4.5 | 5.0 | °C/W | Channel to Case |

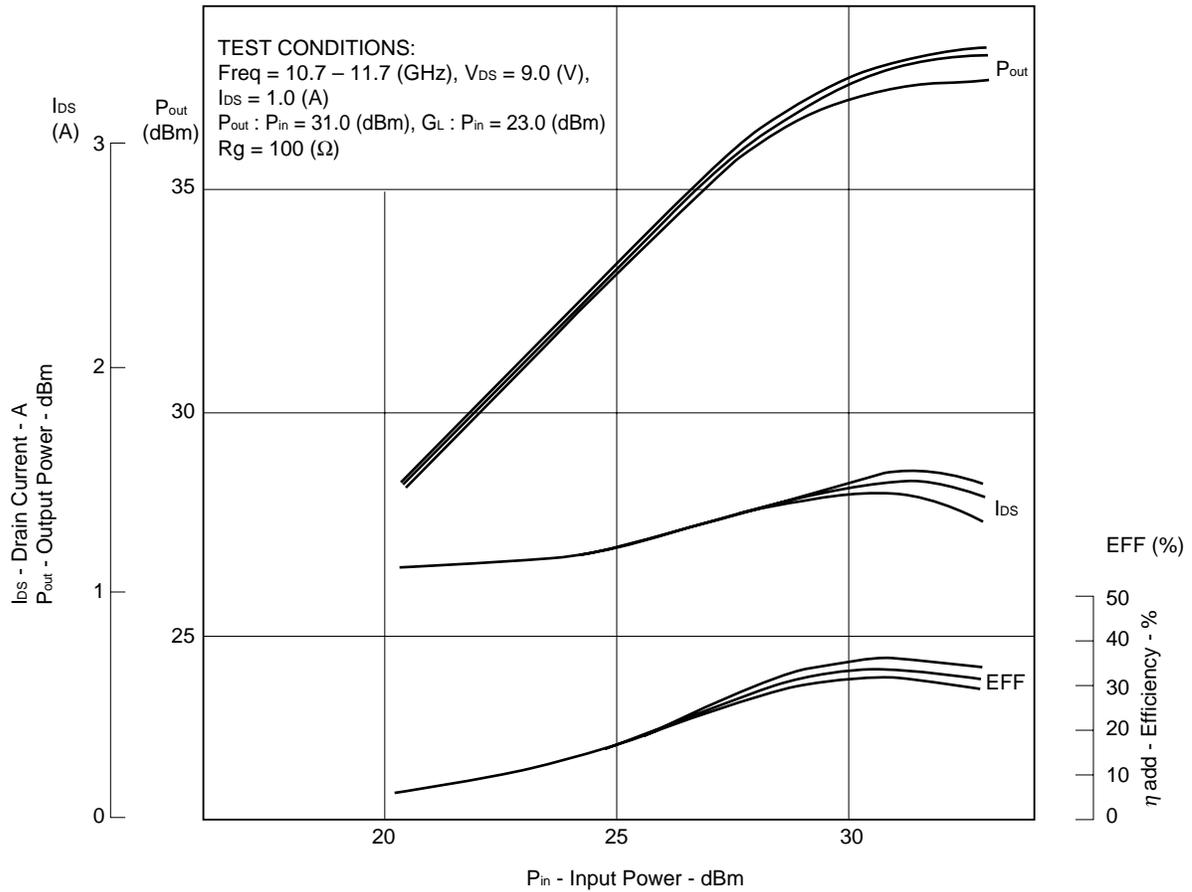
PERFORMANCE SPECIFICATIONS (T_A = 25 °C)

| CHARACTERISTIC | SYMBOL | MIN. | TYP. | MAX. | UNIT | TEST CONDITIONS |
|--------------------------------------|-----------------|------|-------|------|------|---|
| Linear Gain | G _L | 7.5 | 8.0 | – | dB | f = 10.7 to 11.7 GHz, V _{DS} = 9 V I _{DS} = 1.0 A (RF OFF), R _g = 100 Ω |
| Output Power | P _o | 36.5 | 37.5 | – | dBm | P _{in} = 31.0 dBm* |
| Drain Current | I _D | – | 1.25 | 1.35 | A | P _o = 34.5 dBm* |
| 3rd Order Intermodulation Distortion | IM ₃ | – | –37.0 | | dBc | P _{out} = 29.5 dBm/2 tone* |

* The other are the same as the above conditions.

TYPICAL CHARACTERISTICS (T_A = 25 °C)

OUTPUT POWER, DRAIN CURRENT AND EFFICIENCY VS INPUT POWER



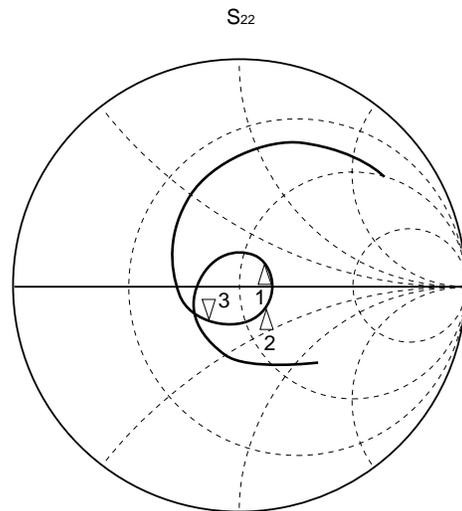
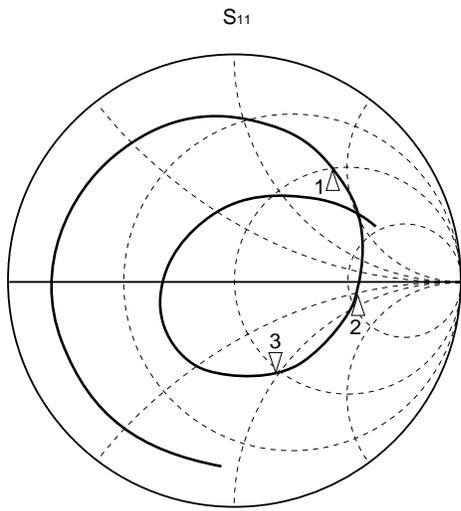
| | | | |
|------------|-------|-------|-------|
| Freq (GHz) | 10.70 | 11.20 | 11.70 |
| G.L (dB) | 8.22 | 8.11 | 8.2 |
| P1dB (dBm) | 37.7 | 37.5 | 37.0 |
| ID-1 (A) | 1.49 | 1.54 | 1.44 |
| EFF-1 (%) | 35.6 | 33.1 | 31.5 |
| Pout (dBm) | 37.9 | 37.7 | 37.3 |
| IDout (A) | 1.52 | 1.57 | 1.47 |
| EFFout (%) | 36.2 | 33.4 | 31.8 |
| IDmax (A) | 1.52 | 1.56 | 1.46 |

S-Parameter

START: 8.5 GHz, STOP: 13.5 GHz
Vds = 9 V, Ids = 1 A

Marker

- Δ 1 = 10.7 GHz
- Δ 2 = 11.2 GHz
- Δ 3 = 11.7 GHz



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Caution

**The Great Care must be taken in dealing with the devices in this guide.
The reason is that the material of the devices is GaAs (Gallium Arsenide), which is
designated as harmful substance according to the law concerned.
Keep the law concerned and so on, especially in case of removal.**

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Anti-radioactive design is not implemented in this product.